



## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### 50 CFR Part 17

[Docket No. FWS–R6–ES–2018–0045; FXES11130900000–201–FF09E22000]

RIN 1018–BC03

### Endangered and Threatened Wildlife and Plants; Removing the Water Howellia from the List of Endangered and Threatened Plants

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), are removing water howellia (*Howellia aquatilis*) from the Federal List of Endangered and Threatened Plants. The best available scientific and commercial data indicate that threats to water howellia identified at the time of listing in 1994 are not as significant as originally determined and are being adequately managed. Therefore, the species no longer meets the definition of an endangered or a threatened species under the Endangered Species Act of 1973 (Act), as amended. This determination is based on a thorough review of all available information, which indicates that this species' populations and distribution are much greater than were known at the time of listing and that threats to this species have been sufficiently minimized.

**DATES:** This rule is effective [INSERT DATE 30 DAYS AFTER THE DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

**ADDRESSES:** This final rule, the supporting documents we used in preparing this rule, and public comments we received are available on the Internet at

<http://www.regulations.gov> at Docket No. FWS–R6–ES–2018–0045. Persons who use a

telecommunications device for the deaf (TDD) may call the Federal Relay Service at 800-877-8339.

**FOR FURTHER INFORMATION CONTACT:** Jodi Bush, Office Supervisor, telephone: 406-449-5225. Direct all questions or requests for additional information to: WATER HOWELLIA QUESTIONS, U.S. Fish and Wildlife Service, Montana Ecological Services Field Office, 585 Shepard Way, Suite 1, Helena, MT 59601. Persons who use a TDD may call the Federal Relay Service at 800-877-8339.

## **SUPPLEMENTARY INFORMATION:**

### **Executive Summary**

*Why we need to publish a rule.* Under the Act, if a species is determined to no longer be an endangered or threatened species, we may reclassify the species or remove it from the Federal Lists of Endangered and Threatened Wildlife and Plants due to recovery. A species is an “endangered species” for purposes of the Act if it is in danger of extinction throughout all or a significant portion of its range and is a “threatened species” if it is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act does not define the term “foreseeable future.” However, we consider “foreseeable future” as that period of time within which a reasonable prediction can be relied upon in making a determination about the future conservation status of a species. Water howellia is listed as threatened. We are removing this species from the Federal List of Endangered and Threatened Plants (i.e., “delist” this species) because we have determined that it is not likely to become an endangered species now or within the foreseeable future. Delisting a species can only be completed by issuing a rule.

*The basis for our action.* Under the Act, we can determine that a species is an endangered or threatened species based on any one or more of the following five factors or the cumulative effects thereof: (A) The present or threatened destruction, modification,

or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. Based on an assessment of the best available information regarding the status of and threats to water howellia, we have determined that the species no longer meets the definition of an endangered or threatened species under the Act.

This final rule recognizes that based on the best available science, water howellia has reached recovery. Collaborative conservation efforts including increased surveys, land transfers, and land management plans have all aided in the discovery of additional occurrences of the species and provided for long-term protection of the species.

### **Previous Federal Actions**

On October 7, 2019, we proposed to remove water howellia from the Federal List of Endangered and Threatened Plants (i.e., to “delist” the species) (84 FR 53380). For previous Federal actions occurring before October 7, 2019, please see the **Previous Federal Actions** section of the proposed rule.

### **Species Description and Habitat Information**

In this final rule, we discuss only those topics directly related to delisting water howellia. For more information on the description, biology, ecology, and habitat of water howellia, please refer to the final listing rule published in the *Federal Register* on July 14, 1994 (59 FR 35860); the most recent 5-year review for water howellia completed in August of 2013 (USFWS 2013, entire); the draft recovery plan for water howellia, completed in September 1996 (USFWS 1996, entire); and the proposed delisting rule published in the *Federal Register* on October 7, 2019 (84 FR 53380). These documents are available as supporting materials on <http://www.regulations.gov> under Docket No. FWS–R6–ES–2018–0045. We use concepts of resiliency, redundancy, and representation (Smith *et al.* 2018) in considering the species’ viability. Resiliency is the ability of the

species to maintain healthy populations that can withstand annual environmental variation and stochastic events. Redundancy is the ability of the species to maintain an adequate number and distribution of populations that can withstand catastrophic events. Representation is the ability of the species to adapt to changing environmental conditions through genetic, ecological, demographic, and behavioral diversity across its range.

Water howellia was first collected in 1879, along the Columbia River in Multnomah County, Oregon (Gray 1880, entire), and is native to the northwestern United States. The taxonomy of water howellia as a full species in a monotypic genus is widely accepted as valid by the scientific community (The Plant List 2013, unpaginated; ITIS 2017).

Water howellia is an annual, aquatic herb in the bellflower family (Campanulaceae). The entire plant is smooth, possessing no hairs or projections. The stems are fragile, submerged and floating, reaching up to 39 inches (in) (100 centimeters (cm)) in length. Stems branch several inches from the base, and each branch extends to the water surface. The numerous leaves are narrow and range from 1–2 in (25–50 millimeters (mm)) long.

Water howellia produce two types of flowers: cleistogamous (closed) and chasmogamous (showy, open for pollination). Small cleistogamous flowers are produced along the stem below the water surface and are self-fertilizing. Chasmogamous flowers are produced on the water surface and commonly self-pollinate (Lesica *et al.* 1988, p. 276; Shelly and Moseley 1988, pp. 5–6).

Suitable water howellia habitat typically includes small, vernal freshwater wetlands and ponds with an annual cycle of filling with water in spring and drying up in summer or autumn (USFWS 1996, p. 14). These habitats can be glacial potholes or depressions (Shapley and Lesica 1997, p. 8; U.S. Department of Defense (USDOD) 2017a, p. 1) or river oxbows (Lesica 1997, p. 366) in Montana and western Washington,

riverine meander scars (Idaho NHP 2017, p. 1; Wiechmann 2014a, p. 3) in Idaho, glacial-flood remnant wetlands (Robison 2007, p. 8) in eastern Washington, or landslide depressions (Johnson 2013, pers. comm.) in California, but are all ephemeral (transitory) to some degree. Depending on annual patterns of temperature and precipitation, the drying of the ponds may be complete or partial by autumn; these sites are usually shallow and less than 3 feet (ft) (1 meter (m)) in depth. Some ponds supporting water howellia are dependent on complex ground and surface water interactions. Snow melt runoff is important in maintaining suitable conditions in the spring, while localized groundwater flow mitigates water loss from evaporation and plant transpiration later in the summer (Reeves and Woessner 2004, pp. 7–9).

The drying of water howellia habitat in late summer and autumn is important because water howellia seeds only germinate when exposed to air (Lesica 1990). Upon air exposure, seeds either germinate in the fall and produce seedlings that overwinter under snowcover, or germinate the following spring, with seeds lying on top of the soil through winter. Water howellia seedlings that overwinter in soil resume growth in spring in northern climates (Mincemoyer 2005, p. 3) or begin growing after fall germination in southern climates (e.g., California) (Johnson 2013, pers. comm.). Spring growth in California and low-elevation occurrences in western Washington typically commence in early April, and in eastern Washington, Idaho, and Montana by early May. Rangewide, emergent (chasmogamous) flowers bloom soon after the stems reach the water surface and are typically present from May through July. Seed dispersal starts in June from submerged (cleistogamous) flowers and extends until late summer from emergent flowers (Shelly and Moseley 1988, p. 5).

Decreased germination rates have been documented for seeds residing in the soil longer than 8 months (Lesica 1992, pp. 415–416). However, monitoring data and observations from Montana (U.S. Forest Service (USFS) 2002, pp. 6–7; USFWS 1996,

pp. 17–18) and Washington (Gilbert 2008, pers. comm.) show the presence of water howellia after 2 consecutive years with no plant observations, suggesting seeds may remain viable for at least 3 years. This life-history strategy likely provides a buffer against unfavorable growing conditions in consecutive years.

Composition and depth of substrates in vernal wetlands are also important characteristics of suitable water howellia habitat. Substrates composed of both coarse organic and mineral sediments are correlated with presence of water howellia (Lesica 1992, p. 417). Similarly, water howellia growth in a laboratory setting was highest in coarse organic substrate (Lesica 1992, p. 416). However, mean depth of the organic sediment layer was significantly less in ponds with water howellia, relative to depth in ponds without water howellia (Lesica 1992, p. 417). These results indicate a moderate amount of organic sediment (with some mineral soil) in wetland substrates may be optimum for water howellia presence and growth.

Water howellia occupies habitats across its range that vary in the extent of canopy cover, suggesting some flexibility to potential effects of disturbance on canopy cover. Many water howellia occurrences are surrounded or nearly surrounded by forested vegetation (Mincemoyer 2005, p. 7), with numerous observations reporting water howellia occupying shaded portions of ponds and wetlands (Isle 1997, p. 32; McCarten *et al.* 1998, p. 4). Conversely, on the Joint Base Lewis-McChord (JBLM) military base in Washington, occupied ponds were historically surrounded by prairie vegetation and, as a result of years of fire suppression, are now surrounded by forest (Gilbert 2017, pers. comm.). Currently, water howellia is occurring in portions of ponds that receive the most light and least shade (Gilbert 2017, pers. comm.). In Montana's Swan Valley, water howellia was present in 78 percent of sites with prior disturbance (roads, fire, grazing, and/or vegetation treatments) of vegetation surrounding the ponds (Pipp 2017, p. 6), indicating some plasticity to the effects of disturbance on extent of canopy cover.

### *Range, Distribution, Abundance, and Trends of Water Howellia*

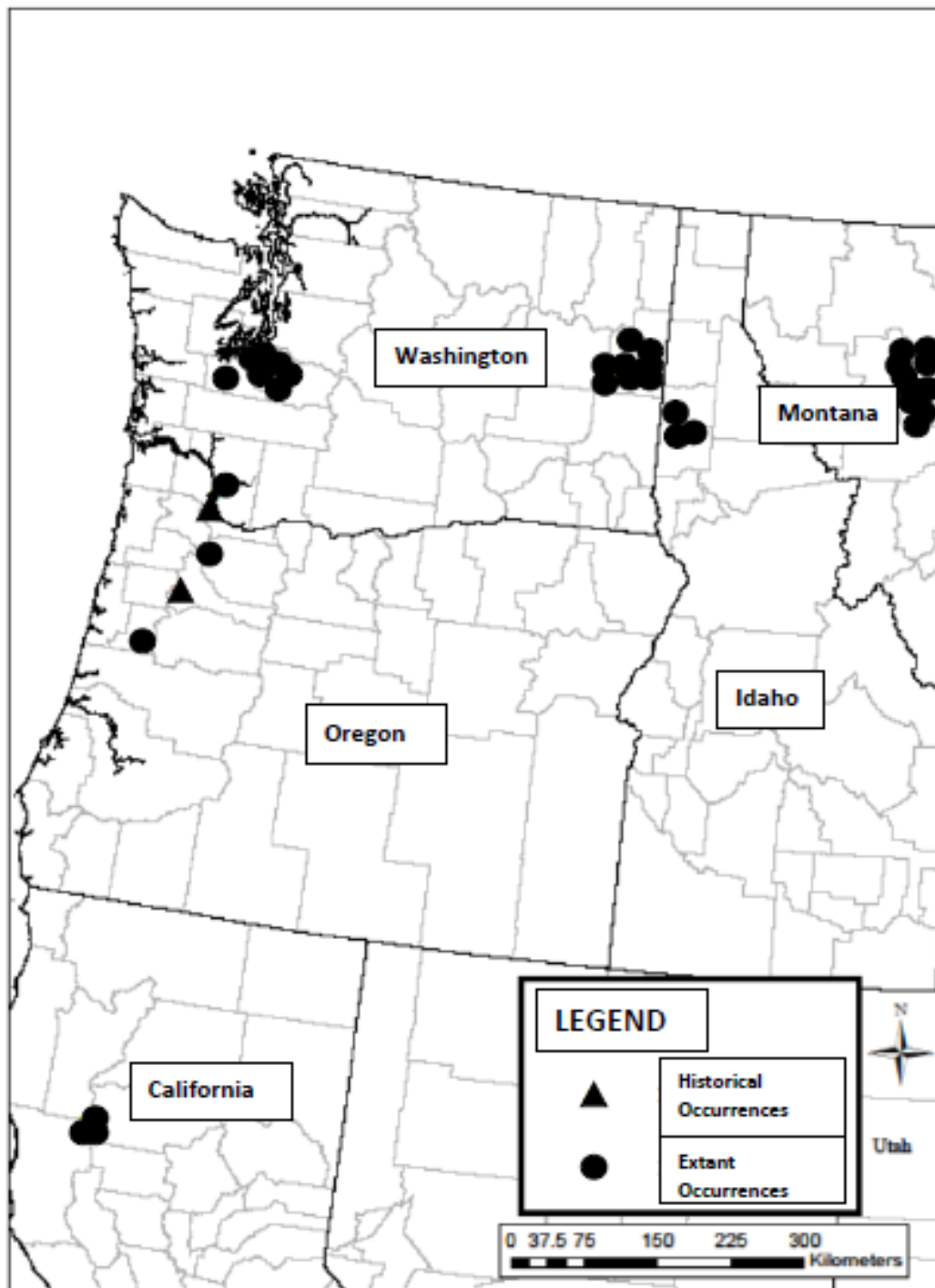
The distribution of water howellia before European settlement and modern development in the Pacific Northwest is unknown. However, after European settlement, water howellia is known from the Pacific Northwest, with historical occurrences documented in California, Oregon, Washington, Idaho, and Montana (Shelly and Moseley 1988, pp. 6, 9). The species still occurs in all five States. Since listing in 1994, new occurrences of water howellia have been documented in all five States, generally in areas within these States known historically to support the species.

At the time of Federal listing (1994), 107 water howellia occurrences were known across the species' range (59 FR 35860; July 14, 1994). In 2020, a minimum of 307 occurrences were documented (see Table 1, below). The majority of extant occurrences (91 percent) are within three metapopulations occupying distinct geographic areas in Montana's Swan Valley (Lake and Missoula Counties); Department of Defense property at JBLM, Pierce County in western Washington; and Turnbull National Wildlife Refuge (Turnbull Refuge), Spokane County in northeastern Washington (see the figure, below). The three metapopulations have enabled the species to remain viable across its range (Freckleton and Watkinson 2002, p. 419). Small, isolated occurrences that are not part of a metapopulation can be more vulnerable to extirpation (Lesica 1992, p. 420). Consequently, identification of these metapopulations is important for directing conservation efforts toward the regional availability of suitable habitat (Freckleton and Watkinson 2002, p. 432). Currently, 258 of the 307 (84 percent) reported water howellia occurrences are on lands administered by the Federal Government. There are 37 reported occurrences of water howellia on private property; however, little is known about them, as limited monitoring of these occurrences has taken place over the years. Two occurrences of water howellia are on State land and the remaining occurrences exist in areas with several jurisdictions (i.e., straddle public and private lands).

**Table 1. Current number of water howellia occurrences and percent of total known occurrences by State.**

<b>State</b>	<b>Number of occurrences</b>	<b>Percent of total known occurrences</b>
Montana	220	72%
Idaho	7	2%
Washington	72	23%
Oregon	2	<1%
California	7	2%
<b>Total</b>	<b>308</b>	





**Figure of historical and extant occurrences of water howellia across the species' known range.**

Population trends for water howellia are difficult to determine. Substantial numbers of new occurrences have been discovered since listing in 1994, and, most recently, occurrences have been documented in Oregon, where the species was thought to be extirpated. However, this may not necessarily indicate a positive population trend.

Rather, this could indicate increased efficiency at finding new occurrences. Consistent, standardized monitoring has not occurred across the range of the species, making it difficult to document trends, even when repeat monitoring has occurred at occupied sites (Fertig 2019, pp. 40–45). Additionally, an occurrence is broadly defined, and abundance of individual water howellia plants within occurrences fluctuates widely. This is due, in part, to environmental conditions of the preceding autumn, which affect seed germination rates. Nevertheless, based on the discovery of many new occurrences and few recent extirpations of existing occurrences, distribution of the species appears to be currently stable.

Genetic variation among water howellia occurrences is low. Occurrences in California and Montana are genetically similar; however, occurrences in Idaho and Washington are more distantly related (Schierenbeck and Phipps 2010, p. 5). These data suggest that gene flow is occurring between occurrences separated by large geographic distances, albeit at a relatively low rate. A correlation between migratory waterfowl routes with either genetic similarity or distance indicates that waterfowl may be transporting seed or plant material between water howellia population areas (Schierenbeck and Phipps 2010, pp. 6–7). A more robust sampling and genetic analysis of water howellia occurrences across the species' range would be necessary to support or refute this hypothesis.

### *Conservation Efforts*

A recovery plan for water howellia was drafted in 1996, but never finalized (USFWS 1996, entire). Despite having not been finalized, the draft recovery plan constitutes the best available information on what objective, measurable criteria should be met in order to delist the species. Here, we provide a summary of progress made on the draft recovery criteria for water howellia. More detailed information related to

conservation efforts can be found below under **Summary of Factors Affecting the Species**.

1. *Recovery criterion:* Management practices, in accordance with habitat management plans, have reduced and/or controlled anthropogenic threats, thereby maintaining the species and its habitat integrity throughout the currently known range on public lands in five geographic areas for 10 years after the effective date of the final recovery plan (when finalized). Monitoring will demonstrate the effectiveness of management plans. Management plans will be in place for, at a minimum, the occurrences listed in the following table:

**Table 2. Formalized management plans per geographic area.**

<b>Geographic Area</b>	<b>Minimum Number of Occurrences Identified in Draft Recovery Plan</b>	<b>Current Number of Occurrences Covered by Management Plans (Percent of total occurrences)</b>	<b>Years Management Plans in Place</b>
Montana	67	191 (62)	22
Spokane County, Washington	33	37 (12)	12
Pierce County, Washington	5	19 (6)	16
Clark County, Washington	4	4 (1)	9
Mendocino County, California	5	7 (2)	24
Totals	114	258 (84)	

*Progress:* Despite the recovery plan not being finalized, management plans are in place on Federal lands for the minimum number of occurrences identified in Table 2, above.

Monitoring indicates management plans have been effective at maintaining the minimum number of occurrences by reducing or eliminating anthropogenic threats associated with land management activities (e.g., timber harvest, road construction, and maintenance) and other threats (e.g., invasive species). Prior to formalized management plans, some conservation efforts were occurring on Federal, State, and some private land. In addition, survey efforts have documented substantially more occurrences of water howellia rangewide than were known at the time of listing (Mincemoyer 2005, pp. 4–5; Frymire 2017, pers. comm.; Gilbert 2017, pers. comm.; Johnson 2017, pers. comm.; Lichthardt and Pekas 2017, p. 1; ORBIC 2017, unpaginated; Rule 2017, pers. comm.).

2. *Recovery criterion:* Foster or promote the conservation of occurrences on lands not addressed by agency management plans. Specifically, this recovery criterion recommends long-term conservation measures for the occurrence in Latah County, Idaho.

*Progress:* Long-term conservation measures for water howellia have been established through land transfers, conservation easements, and management plans on some private lands. In Montana's Swan Valley, large-scale land transfers (67,000 acres (ac) (27,000 hectares (ha)) for the benefit of many species have occurred, and land supporting known water howellia occurrences has been transferred from private to Federal ownership. These occurrences are now protected under Federal agency management plans and conservation strategies. One occurrence located on private land in Latah County, Idaho, is protected under a conservation agreement, held in perpetuity by the Palouse Land Trust. In the 5-year review (USFWS 2013, p. 6), it was noted that, in addition to the conservation agreement, a management plan for this occurrence was being developed (Trujillo 2017, pers. comm.). However, recent communications with Palouse Land Trust indicate that a management plan still needs to be developed for this occurrence (Englund 2020, pers. comm.). Two other occurrences of water howellia on the Coeur d'Alene Reservation in Idaho are being actively managed under the direction of a tribal water howellia management plan (Green 2018, pp. 3-9). The Coeur d'Alene tribe is planning to use active stream/wetland and floodplain restoration, riparian buffering, and outplanting to conserve existing water howellia occurrences and expand the distribution of the species into nearby potentially suitable habitat (Green 2018, entire). The Service is unaware of any information regarding additional efforts to protect water howellia occurrences on private land in other parts of the species' range.

3. *Recovery criterion:* A post-delisting strategy for monitoring the species' population dynamics is in place.

*Progress:* We have developed a post-delisting monitoring plan in cooperation with State, Federal, Tribal, and nongovernmental conservation partners. The final post-delisting monitoring plan is available for public review on <http://www.regulations.gov> under Docket No. FWS-R6-ES-2018-0045.

Additionally, the 5-year review recommended development of a memorandum of understanding (MOU) with the USFS and U.S. Department of Defense (USDOD) to ensure the continuation of existing conservation measures currently benefitting water howellia. Although a formal MOU has not been developed, both agencies have specific conservation strategies in place for the conservation of water howellia (for specific conservation strategies, see discussion of land management effects under A. *The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range*, below).

### **Summary of Changes from the Proposed Rule**

Based on public comments on our October 7, 2019, proposed rule (84 FR 53380) and information provided to us by peer reviewers, we made updates or provided additional clarity on information concerning population monitoring vs. surveying, predicted effects of invasive species, regulatory mechanisms, climate change, wetland/pond hydrology, genetic diversity, cumulative effects, post-delisting monitoring, and metapopulation structure. We also made other minor editorial clarifications and corrections in this final rule.

### **Summary of Factors Affecting the Species**

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for listing species, reclassifying species, or removing species from listed status. “Species” is defined by the Act as including any species or subspecies of fish or wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). The Act defines an “endangered species” as a species that is “in danger of extinction throughout all or a significant portion of its range,” and a “threatened species” as a species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The Act requires that we determine whether any species

is an “endangered species” or a “threatened species” because of any of the following factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) overutilization for commercial, recreational, scientific, or educational purposes;

(C) disease or predation;

(D) the inadequacy of existing regulatory mechanisms; or

(E) other natural or manmade factors affecting its continued existence.

We must consider these same five factors in delisting a species. For species that are already listed as endangered or threatened species, this analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the removal of the Act’s protections. According to 50 CFR 424.11(e), we may delist a species if our status review of the best available scientific and commercial data indicates that the species is neither endangered nor threatened for the following reasons: (1) The species is extinct; (2) the species does not meet the definition of an endangered species or a threatened species (e.g., due to recovery); or (3) the listed entity does not meet the statutory definition of a species.

Water howellia is currently listed as threatened. Section 3(20) of the Act defines a “threatened species” as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act does not define the term “foreseeable future.” Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term “foreseeable future” extends only so far into the future as we can reasonably determine that both the future threats and the species’ responses to those

threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. “Reliable” does not mean “certain”; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species’ likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species’ biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

For water howellia, we consider 30 years to be a reasonable period of time within which reliable predictions can be made for the species. This time period includes multiple generations of water howellia. Additionally, various global climate models and emission scenarios provide consistent predictions within that timeframe (IPCC 2014, p. 11). We consider 30 years a relatively conservative timeframe in view of the long-term protections in place for 84 percent of the species’ occupied habitat occurring on Federal land.

A recovered species has had threats removed or reduced to the point that it no longer meets the Act’s definition of an “endangered species” or a “threatened species.” A species is an “endangered species” for purposes of the Act if it is in danger of extinction throughout all or a significant portion of its range and is a “threatened species” if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. For the purposes of this analysis, we will evaluate whether or not the currently listed species, water howellia, should continue to be listed as threatened, based on the best scientific and commercial information available.



We use the term “threat” to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term “threat” may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an “endangered species” or a “threatened species” or that it should remain listed as such. In determining whether a species meets either definition, we must evaluate all identified threats by considering the species’ expected response and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species—such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an “endangered species” or a “threatened species” only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The following analysis examines the factors currently affecting water howellia or that are likely to affect it within the foreseeable future.

#### *Habitat-based Threats*

At the time of listing (59 FR 35860; July 14, 1994), the following potential habitat-based threats were identified for this species: (1) Invasive species, (2) land management (primarily timber harvest and road building), (3) trampling by domestic livestock, (4) direct habitat loss from urbanization or dam construction, and (5) the

narrow ecological requirements of the species. In the analysis that follows, we also considered climate change in the context of the species' narrow ecological requirements.

### Invasive Species

In the final listing rule (59 FR 35860; July 14, 1994), invasive plant species were identified as a threat to water howellia in habitats where they overlap. Invasive species, such as reed canarygrass (*Phalaris arundinacea*), sweet flag (*Acorus calamus*), and yellow flag iris (*Iris pseudacorus*), were identified to have the capacity to outcompete water howellia, presumably for nutrients and space (Lesica 1997, p. 367; Clegg et al. 2000, p. 13; Lichthardt and Pekas 2017, entire). These invasive species may have the potential to extirpate water howellia occurrences (59 FR 35860; July 14, 1994), and as a result, we focus our analysis on these species. The best available information does not indicate any potentially significant negative impacts to water howellia from any other invasive species.

Reed canarygrass is present in water howellia habitat in all States, except California (Johnson 2017, pers. comm.), but the extent of invasion varies by site (Gilbert 2017, pers. comm.; Rule 2017, pers. comm.; Shelly 2017, pers. comm.; Lesica 1997, pp. 367–368). Abundance of reed canarygrass in ponds occupied by water howellia on the Turnbull National Wildlife Refuge (NWR) has fluctuated through time, with no definitive long-term trend (Rule 2017, pers. comm.; Rule 2020, in progress). Abundance of reed canarygrass in ponds occupied by water howellia on the JBLM has also fluctuated through time, with no definitive long-term trend (Gilbert 2017, pers. comm.; Gilbert 2020, pers. comm.). In Montana, reed canarygrass is present in many ponds occupied by water howellia, but increased distribution has not been detected recently (Shelly et al. 2016, entire; Shelly 2017, pers. comm.). However, reed canarygrass invaded Swan River Oxbow Preserve in the Swan Valley in Montana, and water howellia was subsequently extirpated at that site (Lesica 1997, pp. 367–368; Lesica 2001, p. 2). In Idaho, monitoring

efforts have not detected any decreases in pond size, which may act as a surrogate for reed canarygrass colonization; however, detailed monitoring of the species has not been conducted (Lichthardt and Pekas 2017, p. 6). Little is known about the extent of reed canarygrass invasion with regard to water howellia occurrences in Oregon.

The mechanisms driving the invasive potential of reed canarygrass within water howellia habitats are unclear. The invasive potential may be due to some sites being occupied by a native genotype of reed canarygrass and other sites being occupied by a highly invasive variety (Casler et al. 2009, entire; Lichthardt and Pekas 2017, p. 8; Wiechmann 2014a, p. 31; Jakubowski et al. 2013, entire; Merigliano and Lesica 1998, entire). Density of reed canarygrass is a better determinant of impact to water howellia occurrences than presence alone (Wiechmann 2014a, pp. 31, 34, 38). Additionally, in some ponds, reed canarygrass was found to be dominant at shallower water depths and water howellia dominant at deeper depths (Wiechmann 2014a, p. 32).

Success of mechanical and chemical treatment efforts to decrease the abundance and distribution of reed canarygrass have varied across the range of water howellia. In California, mechanical treatment has limited the spread of reed canarygrass in ponds and wetlands adjacent to water howellia occurrences, and chemical treatment is further reducing the size of reed canarygrass patches (Johnson 2011, 2017, pers. comm.). Similarly, consistent suppression of reed canarygrass at JBLM (military base) in Washington has reduced patch sizes of the plant in the past (TNC 2006, p. 65; Engler 2008, pers. comm.; Gilbert 2008, pers. comm.). Currently, no suppression efforts are underway at JBLM, due to little change in reed canarygrass distribution and the risk of harming water howellia plants in the process (Gilbert 2017, pers. comm.). In Idaho, the success of suppression efforts to limit abundance and distribution of reed canarygrass were mixed (Lichthardt and Gray 2010, p. 9). However, once suppression efforts were stopped, distribution and abundance of reed canarygrass appeared to vary more with

fluctuating environmental conditions than with the presence of suppression effort (Lichthardt and Gray 2010, p. 9). No suppression efforts to control or eradicate reed canarygrass on the Turnbull NWR in Washington are currently underway; the species is present, but trends indicate variability in abundance with fluctuating environmental conditions (Rule 2009, 2013a, 2017, pers. comm.). In Montana, suppression efforts of reed canarygrass have been somewhat successful in some areas (Annen 2010, entire; Healy 2015 and references therein, entire) and not successful in other areas (Lesica and Martin 2004, entire; Lesica 2001, entire).

Sweet flag was identified by the State of Idaho as an invasive species that may be displacing water howellia at one location (Idaho Department of Fish and Game (IDFG) 2016, p. 3). Monitoring at this location has been ongoing since 1999, and water howellia has not been observed since 2001 (Lichthardt and Pekas 2017, p. 2). However, we are unaware of any other water howellia occurrences being affected by sweet flag. As a result, sweet flag is unlikely to become a threat to water howellia.

Yellow flag iris is an invasive plant that has been identified in ponds occupied by water howellia on JBLM in Washington. While it appears yellow flag iris may have the ability to displace or outcompete water howellia in some environments, the infestations on JBLM occur in relatively small areas, and their spread has been controlled by herbicides or mechanical removal (Clegg et al. 2000, p. 13; Gilbert 2019, pers. comm.).

Invasive plants can be aggressive and quickly displace native plants in some situations. While there are some small sites that may have been completely or partially overtaken by invasive plants, water howellia metapopulations appear to maintain viability in the face of invasive species. This conclusion is reinforced by reed canarygrass coexisting with extant water howellia occurrences; large-scale displacement of water howellia by reed canarygrass is not occurring in any of the metapopulations (Swan Valley, Montana; Turnbull NWR and JBLM, Washington), even in the absence of

suppression efforts. Given the absence of displacement of water howellia by reed canarygrass within the three metapopulations of water howellia, and the success of existing suppression efforts where they have been applied, we do not consider reed canarygrass to be a significant threat to water howellia. The best available information does not indicate that any other invasive species likely pose a threat to water howellia.

#### Land Management Activities

Land management activities that cause disturbance to vegetation surrounding water howellia occurrences were identified as a threat to the species in the final listing rule (59 FR 35860; July 14, 1994). Previous modeling efforts suggested that these activities, singularly or in combination, could result in a loss of vegetation at the pond fringe, disrupting the hydrological cycle and negatively impacting the phenology of water howellia (Reeves and Woessner 2004, pp. 10, 15). However, more recent evidence indicates that effects from land management activities are no longer a threat to the species.

Most land management activities that could disturb vegetation surrounding water howellia occurrences on USFS land are now prohibited or designed to minimize impacts to water howellia. For example, land management activities on the Flathead National Forest in Montana must create a favorable physical environment that protects against hydrological changes that may adversely impact water howellia (USDA 2018, pp. 45–46). These desired conditions and guidelines were incorporated as part of the revised Flathead National Forest Plan in 2018. On the Mendocino National Forest in California, activities that could disturb vegetation within 300 ft (91 m) of water howellia occurrences are typically not allowed because of standards and guidelines to protect the plant (USFS 1995, p. IV-32; Johnson 2013, pers. comm.). Limited activities (including prescribed fire) may be allowed within the 300-ft (91-m) buffer, but only if needed to maintain the integrity of the buffer (USDA 2018, pp. 18–23, 44–46; Johnson 2013, pers. comm.). The

2018 revised Flathead National Forest Plan in Montana has also incorporated the conservation strategy for water howellia, which was finalized in 1997 (USFS 1997, entire; for a more in-depth discussion of land management plans, see *Existing Regulatory Mechanisms*, below). As a result of these actions, abundance and distribution of water howellia have remained stable in Montana's Swan Valley from 1978 to 2014 (Pipp 2017, p. 14).

On State land in Montana, clear-cutting of timber and prescribed fire are prohibited within defined buffers surrounding waterbodies (Montana Code Annotated 2019, title 77, chapter 5, part 3, at 77-5-303). In Washington, buffer zones are established in wetlands containing water howellia on Turnbull NWR when mechanical thinning and prescribed fire are used to treat conifer encroachment (Rule 2009, pers. comm.). Timber harvest and prescribed fire were not identified as potential threats to other water howellia occurrences in Washington (USDOD 2006, entire; USDOD 2012, entire; USDOD 2017a, entire; Anderson 2013, pers. comm.; Gilbert 2013, 2017, pers. comm.), or occurrences in Oregon or Idaho (Currin 2013, pers. comm.; USFWS 2009, entire; IDFG 2016, entire).

Some disturbance of vegetation surrounding water howellia occurrences from land management activities occurred historically, prior to existing guidelines and standards in Federal land management plans. For example, in Montana's Swan Valley, historical disturbances caused from land management activities (e.g., timber harvest, timber thinning, prescribed fire, road building, grazing) have occurred in vegetated buffers surrounding many of the existing water howellia occurrences (Pipp 2017, p. 6). However, 79 percent of existing water howellia occurrences in the Swan Valley have experienced at least one historical disturbance event in the surrounding vegetation and are still viable, indicating some tolerance of water howellia to buffer disturbance. In addition, abundance or distribution of water howellia in the Swan Valley has remained stable, despite these historical disturbances from land management activities (Pipp 2017, p. 14).

Furthermore, despite experiencing a stand-replacing fire in 2003, water howellia occurrences in the affected area of the Swan Valley are stable; buffer vegetation appears to have recovered, and hydrology is adequately functioning (Pipp 2017, pp. 14–15).

The effects of historical road building within vegetated buffers surrounding water howellia occurrences have largely been mitigated on Federal and State lands. Guidance established in the revised Flathead National Forest Plan indicates that maintenance on roads within 300 ft (92 m) of ponds providing habitat for water howellia should maintain or improve hydrological integrity to protect habitat conditions (USDA 2018, pp. 45–46). No effects of historical roads occurring within vegetated buffers on water howellia in the Swan Valley were found in a recent analysis (Pipp 2017, p. 16). Similarly, in California, small spur roads are being closed and hydrologically stabilized in areas occupied by water howellia on the Mendocino National Forest to minimize anthropogenic contribution to landscape instability per direction in the Mendocino National Forest Plan (USFS 1995, p. III-26; Johnson 2008, pers. comm.). These conservation measures appear to be working in California, as six of the seven known occurrences of water howellia are still viable. In Idaho, the Idaho Transportation Department (ITD) avoids adverse effects to wetlands during project implementation, and a Best Management Practices Manual identifies measures to minimize any potential effects during project implementation (ITD 2014, entire; ITD 2017, p. 1). The State of Idaho identified two water howellia occurrences within 98 ft (30 m) of an established highway and expressed concern about indirect effects of road work resulting in sedimentation and, of less concern, potential removal of shade (IDFG 2016, p. 4). However, the best available information does not indicate any potential effects that road work may pose to this population. Roads were not cited as a threat to water howellia occurrences in Washington or Oregon (USDOD 2006, entire; USDOD 2012, entire; USDOD 2017a, entire; USFWS 2007, entire; USFWS 2010; entire; Anderson 2013, pers. comm.; Currin 2013, pers. comm.).

Land management activities (e.g., timber harvest, timber thinning, road building, grazing, and prescribed fire) that disturb vegetation surrounding water howellia occurrences were once considered a threat to the species. However, most land management activities that have the potential to disturb surrounding vegetation are prohibited by land management plans or other Federal or State policy. Some of these prohibitions were put in place as a result of the species being listed, but will remain in effect for the duration of the land management plan or other policy, even when the species is delisted. Where disturbance of vegetation from land management activities has occurred, water howellia has shown some tolerance for disturbance and no downward trend in presence or distribution. Given that all three metapopulations currently have conservation measures in place to avoid vegetative buffer disturbance from land management activities and that water howellia has shown some tolerance to disturbance when it occurs, we no longer consider land management activities to be a significant threat to water howellia.

#### Trampling by Domestic Livestock

Trampling of water howellia by domestic livestock was cited as a threat in the final listing rule for the species (59 FR 35860; July 14, 1994). Direct effects of plant crushing, seed bank disturbance, and alterations to substrate are likely to occur when livestock enter and exit ponds and wetlands. In addition, increased nutrient loading may be an indirect effect of livestock occupancy in and near water howellia habitat. Some water howellia occurrences are within habitats actively used by livestock. However, the level of livestock-caused disturbance that water howellia can withstand is not known and likely varies with site-specific conditions, as well as timing, severity, and duration of livestock use of occupied water howellia habitat.

The effects of trampling on water howellia occurrences on Federal and State land have largely been mitigated by fencing, cattle barricades, elimination of grazing in some



areas occupied by water howellia, or limitations on the duration of time livestock have access to sensitive pond and wetland habitats (USFS 2002, p. 6; Mincemoyer 2005, p. 11; Johnson 2008, 2013, pers. comm.; Frymire 2017, pers. comm.). In Montana, analyses of monitoring data spanning nearly 30 years have concluded that despite some grazing in occupied habitat, the presence of water howellia has not been affected (Pipp 2017, p. 17).

Although no causal link was made between grazing levels and the probability of water howellia presence in the Pipp (2017) analysis, it appears that management actions such as fencing, cattle guards, and exclusion implemented concurrently with grazing have provided protections to water howellia habitat and allowed the species to be conserved in Montana's Swan Valley (Pipp 2017, p. 17). In California, specific grazing regimes near five occupied ponds within an active grazing allotment on National Forest land appear to be effective; monitoring indicates no effects to water howellia occurrences from livestock trampling (Johnson 2013, pers. comm.). Two other water howellia occurrences in California are within inactive grazing allotments, where livestock are not currently present and not expected to be present in the future (Johnson 2013, 2017, pers. comm.). Trampling is not reported as a threat in Washington, Idaho, or Oregon (USDOD 2006, entire; USDOD 2017a, entire; USFWS 2007, entire; USFWS 2010, entire; Currin 2013, pers. comm.; IDFG 2016, entire). It is unknown where grazing may occur on the 37 occurrences (12 percent of total known occurrences) on private property. Therefore, the extent of trampling and other livestock-related alterations to water howellia habitat on these private lands is unknown. However, potential trampling effects from livestock on Federal and State land have been largely mitigated.

Trampling of water howellia by domestic livestock is not a threat to the species on Federal or State land at current grazing levels because of mitigation measures being implemented, including riparian fencing, cattle guards, and timely removal or relocation of livestock from sensitive pond and wetland habitats. The best available information

does not indicate that levels of livestock use (and thus potential trampling) will increase beyond current levels in the future. The severity and frequency of trampling of water howellia occurrences on private land are unknown, but as significantly fewer water howellia occurrences are known from private lands, any impacts are likely not significant at the species level and have not affected recovery, which has been achieved based on species viability on State and Federal lands. We conclude, based on the available information, that trampling by domestic livestock is not a significant threat to water howellia.

#### Habitat Loss from Urbanization and Dam Construction

Habitat loss from urbanization and dam construction occurred historically, particularly in Oregon, and was considered a threat to water howellia at the time of listing in 1994. However, additional habitat loss from urbanization and dam construction is no longer a threat to the species because conservation strategies implemented following listing and increased Federal ownership now provide additional protections (see *Conservation Efforts*, above).

Direct habitat loss from urbanization and dam construction occurred along the Columbia River in Oregon, and water howellia was thought to be extirpated from that area prior to 2015 (USFWS 2017, entire; Norman 2010, pers. comm.). However, since then, two occurrences of water howellia have been located in the Portland, Oregon, metro area (ORBIC 2017, unpaginated).

Most of the water howellia occurrences on corporate or private lands in Montana were previously owned by Plum Creek Timber. In 2007, approximately 67,000 ac (27,000 ha) of Plum Creek land in the Swan Valley were sold to The Nature Conservancy (TNC) and Trust for Public Land; ownership was then transferred to either the USFS or the State of Montana (Swan Valley Connections 2017, entire). The 47 water howellia occurrences and potential habitat that were formerly on Plum Creek land are now

protected from urbanization through either the Flathead National Forest Plan (USFS 1997, entire) or State agency direction for managing timberlands (DNRC 1996, p. 1). The Flathead National Forest Plan mandates avoidance of disturbance, including urbanization, in forested buffers of a minimum of 300 ft (91 m) from water howellia occurrences. The State of Montana manages its timberlands for long-term revenue and biodiversity (DNRC 1996, p. 2) and not for short-term revenue from selling timbered State lands and the potential urbanization that may follow.

It is unknown if historical habitat loss occurred in California; however, most known occurrences of water howellia are within USFS lands, including some within designated wilderness areas (Johnson 2013, pers. comm.). Therefore, no current or future threat of habitat loss from urbanization is expected because any disturbance of vegetated buffers surrounding water howellia ponds is prohibited under the Mendocino National Forest Plan unless it is necessary to promote natural ecological and hydrological function (USFS 1995, pp. IV-19, 35). It is unknown how urbanization has affected the 37 water howellia occurrences on private land, but because there are significantly fewer occurrences known from private lands (12 percent of total known occurrences), these impacts are likely not significant at the species' level.

In sum, habitat loss from urbanization and dam construction occurred historically, particularly in Oregon, but is no longer considered a significant threat. In Oregon, recent new discoveries of water howellia indicate that the species has been able to remain extant on the landscape where it was once considered extirpated. In areas surrounding the extant, larger metapopulations, habitat loss from urbanization and dam construction is not considered a threat to the species because of conservation strategies and land transfers implemented in Montana (USFS) and Washington (USDOD and the Service). Furthermore, known habitat in California is largely within USFS lands, including

designated wilderness; thus, there is no significant threat of habitat loss from urbanization or dam construction in California.

### *Summary of Habitat-based Threats*

Based on the final listing rule (59 FR 35860; July 14, 1994), the following stressors warranted consideration as possible current or future threats to water howellia : invasive species, land management activities, trampling by domestic livestock, and direct habitat loss from urbanization or dam construction. However, as described below, these stressors have not occurred to the extent determined or anticipated at the time of listing in 1994, or the stressors are being adequately managed, or the species is more tolerant of the stressor than was previously thought.

- Land management plans and conservation management strategies have been adopted by Federal and State agencies to mitigate the effects of land management activities on water howellia and are in place for all three metapopulations. These plans vary in duration, but are longer term (15+ years) and are expected to continue to provide protections to water howellia habitat into the future because the plans (and all future revisions to the plans) are mandated by Federal laws to conserve fish, wildlife, and plant species. For a more in-depth discussion of land management plans and relevant Federal laws, see *Existing Regulatory Mechanisms*, below.

- Suppression efforts directed at reed canarygrass have resulted in some success. Furthermore, water howellia occurrences are not currently being displaced by reed canarygrass, and the best available data do not indicate that they are being displaced by other invasive species.

- The installation of riparian fencing and cattle barricades and the implementation of specific grazing routines have effectively mitigated the effects of trampling on water howellia.

- The extant metapopulations, as well as most occurrences in California, are largely managed by Federal agencies that have conservation strategies in place.

Therefore, neither urbanization nor dam construction is a threat to water howellia.

- Limited information is available regarding the 37 occurrences (12 percent of known occurrences) that occur on private property. Due to the low number of occurrences on private land relative to Federal and State land, impacts to water howellia on private lands are likely not significant at the species level.

Therefore, based on the available information, we do not consider there to be any significant habitat-based threats for water howellia.

#### *Overutilization of the Species*

Overutilization, for any purpose, was not considered a threat in the final rule to list water howellia (59 FR 35860; July 14, 1994). The best available information does not indicate any current use of water howellia for commercial, recreational, scientific, or educational purposes. Regarding future utilization, interest has been expressed by the Valencia Wetland Mitigation Bank in Priest River, Idaho, to collect seed via soil plugs from vigorous water howellia occurrences for use in establishing new occurrences where appropriate habitat exists (Wiechmann 2014b, entire). Initially, a harvest of 5 to 7 soil plugs from other Idaho occurrences has been proposed. The proposed project would be beneficial if it created another occurrence of water howellia in northern Idaho or had educational value. Recent communications with Valencia Wetland Mitigation Bank indicate that they are still interested in pursuing this project (Collier 2020, pers. comm.). We are not aware of any other current or future plans for use of the species. Therefore, based on the available information, we find that there are no significant threats to water howellia related to overutilization for commercial, recreational, scientific, or educational purposes.

#### *Disease or Predation*

Predation (herbivory) on water howellia by domestic livestock was considered a threat in the final rule to list the species (59 FR 35860; July 14, 1994). As described in more detail above, grazing is limited within the species' habitat, and the occurrence of water howellia in ponds accessible to livestock in the Swan Valley metapopulation has not been affected (Pipp 2017, p. 17). As a result, we conclude that predation does not affect the species throughout its range at the population or species level. The best available information does not indicate that levels of livestock grazing will increase within known occurrences of water howellia in the future. The best available information also does not indicate any issues or potential stressors regarding disease or insect predation. Therefore, based on the available information, we do not consider there to be any significant threats to water howellia from disease or predation.

#### *Other Factors Affecting the Species*

In this section, we discuss: (1) the narrow ecological requirements of the species in the context of climate change, (2) small population size/low genetic diversity, and (3) the potential for cumulative effects of stressors.

##### *Narrow Ecological Requirements/Climate Change*

Here, we consider the narrow ecological requirements of water howellia in the context of observed or projected changes in climate. The July 14, 1994, listing rule (59 FR 35860) did not discuss the potential impacts of climate change on water howellia. The terms "climate" and "climate change" are defined by the Intergovernmental Panel on Climate Change (IPCC). The term "climate" refers to the mean and variability of relevant quantities (i.e., temperature, precipitation, wind) over time (IPCC 2014, pp. 119–120). The term "climate change" thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to internal processes or anthropogenic changes (IPCC 2014, p. 120).

Global climate projections are informative, and in some cases, the only or the best scientific information available for us to use. However, projected changes in climate and related impacts can vary substantially across and within different regions of the world (e.g., IPCC 2013c, 2014, entire) and within the United States (Melillo et al. 2014, entire). Therefore, we use “downscaled” projections when they are available and have been developed through appropriate scientific procedures, because such projections provide higher resolution information that is more relevant to spatial scales used for analyses of a given species (see Glick et al. 2011, pp. 58–61, for a discussion of downscaling).

Climate change trends predicted for the Pacific Northwest (Oregon, Washington, Idaho, and Montana) broadly consist of an increase in annual average temperature; an increase in extreme precipitation events; and, with less certainty, variability in annual precipitation (Dalton et al. 2013, pp. 31–38, Figure 1.1; Snover et al. 2013, pp. 5-1–5-4). Lee et al. (2015) describe potential hydrological changes in response to predicted climate change on montane wetlands in the Pacific Northwest. These observations appear to vary with local conditions and include earlier drawdown, more rapid drying out in the summer, and reduced minimum water levels.

Yearly weather patterns influence abundance of water howellia. Abundance of water howellia is typically lower if the preceding season had higher precipitation and/or cooler summer temperatures (Shelly et al. 2016, entire). This decrease is likely due to limited pond drying, which negatively affects seed germination rates due to their need for air exposure to germinate. Conversely, abundance of water howellia is typically higher if the preceding season had lower precipitation and/or hotter summer temperatures (Shelly et al. 2016, entire), due to more pond drying and increased rates of seed germination.

There is uncertainty regarding how the predicted trends in precipitation and air temperature due to climate change in the Pacific Northwest will influence water howellia. In western Montana, where all the known statewide occurrences of water howellia occur,

regional climate data predict (1) increasing average annual air temperatures and (2) precipitation increasing in winter, spring, and fall and decreasing in summer (Montana 2017, pp. 40–63). These predicted conditions are similar to those observed to increase water howellia abundance (e.g., increased pond drying with annual recharge in the winter, spring) in Montana historically. Thus, future climate conditions may be favorable, on average, for water howellia. In Washington, predicted increases in air temperature and more rapid drying of montane wetlands could be favorable to water howellia, assuming adequate recharge in the winter and spring (Shelly et al. 2016, entire). The effects of predicted increased variability in precipitation on water howellia remains unclear. A potential increase in precipitation as a result of climate change may affect the species in several ways. First, increases in precipitation may increase the surface area of existing ponds and wetlands, or create new ones. These new habitats would be available for colonization by water howellia and could increase the range and resiliency of the species. However, new habitats would also be available to invasive species such as reed canarygrass and may also promote their expansion on the landscape. An important factor in increased habitat would likely be the site-specific conditions within each habitat; new habitat with deeper water and longer periods of inundation would likely preclude the establishment of reed canarygrass and be beneficial to water howellia. Conversely, the creation of shallower habitat may favor reed canarygrass. Another possible effect of increased precipitation may be the alteration of the hydrologic cycle of water howellia habitats. Specifically, these habitats may fill earlier (with heavier spring rainfall) and dry later in the season than they did historically, thereby reducing the timing window for air exposure needed for seed germination of water howellia in late summer and autumn.

Alternatively, a potential decrease in precipitation as a result of climate change also may affect water howellia in several ways. Decreases in precipitation may result in water levels that are too low to support the submergent flower production. Additionally,



earlier drawdowns and the faster receding of water in these wetlands as a result of decreased precipitation may ultimately limit the continued persistence of ephemeral ponds. This could provide an opportunity for expansion of reed canarygrass and other invasive species. On the other hand, amplified drying may allow for increased germination and expansion of water howellia. Another scenario with decreased precipitation is that the hydrological cycles could be altered in a way that would favor water howellia. Ponds that were previously perennial could potentially become ephemeral in nature, providing the wetting and drying cycle necessary for water howellia reproduction and, consequently, additional habitat for the species to occupy. Again, the site-specific conditions for each habitat would be an important factor.

Changes in precipitation from snow to rain may also affect water howellia, particularly in the southernmost occurrences (e.g., California) (California DWR 2013, p. 22). More precipitation falling as rain rather than snow would likely alter the hydrologic cycle within these habitats. These alterations could include faster drying of wetlands than was observed historically, due to a lack of spring run-off from snow fields and increased annual air temperature. More frequent extreme precipitation events are predicted for California (California DWR 2013, p. 23). The effect of more extreme precipitation events on water howellia habitat in California is unclear, especially given the potential for interactions among precipitation and other environmental variables predicted to change (e.g., reduced snowpack, increased annual air temperature).

The ability of water howellia to self-fertilize and produce seeds at both the early season submergent and later season emergent forms may be an advantage to surviving lengthened, shortened, or generally more inconsistent growing seasons than occurred historically. Seed production from both flower forms in one growing season may increase the opportunity for surviving subsequent inclement years. It is uncertain how increases in water temperature and increased evaporation due to increased ambient temperatures

would affect growth and reproduction of water howellia; however, climate conditions that restrict the dual seed production and seed banking could reduce the ability of water howellia to sustain populations over time.

Associated wetland vegetation that positively contributes to suitable microclimates for water howellia could be altered by predicted variance in temperatures and precipitation; the effects of which are uncertain. Occurrences of water howellia in Montana and eastern Washington could be more resilient to these processes than other occurrences because of their distribution over a larger landscape with many separate occurrences. Increasing temperatures combined with increased demand for ground and surface water for human development may compound negative impacts to water howellia in eastern Washington and northern Idaho. Climate-induced effects on water howellia may appear first in California, as these occurrences are at the southern edge of the known range. However, these effects may be buffered by the higher elevation (approximately 3,800 ft (1,158 m)) at which the California occurrences are found compared to elsewhere in the range (western Washington: approximately 15 ft (5 m)).

Predicted environmental changes resulting from climate change may have both positive and negative effects on water howellia, depending on the extent and type of impact and depending on site-specific conditions within each habitat type (Lee et al. 2015, p. 14). The primary predicted negative effect is the alteration of hydrologic regimes (Lee et al. 2015, p. 14) potentially resulting in inconsistent growing seasons. This effect will likely be buffered by the ability of water howellia to produce seeds during both early and late seasons. Predicted environmental effects that may be positive for water howellia include increased habitat, seed dispersal, and species distribution in some areas, including within the three metapopulations due to predicted increases in precipitation across the northern range of the species (IPCC 2014, p. 61). The intact nature and current spatial arrangement (geographically diverse and at varying elevations) of the three large

metapopulations will likely provide more resilience to climate change than the smaller, isolated occurrences. Effects of potential composition shifts in vegetation surrounding water howellia occurrences as a result of climate change are unknown.

In summary, climate change is affecting and will continue to affect temperature and precipitation events. The extent, duration, and impact of those changes are unknown, but could potentially increase or decrease precipitation in some areas. Water howellia may experience climate change-related effects in the future, most likely at the individual or local population level. Regional occurrences may experience some shifts. However, it is anticipated that the metapopulations important to the viability of the species would continue to be viable because of resiliency due to geographic and elevational diversity rangewide and because some of the future predicted air temperature and precipitation conditions are similar to the yearly weather conditions that promote larger abundances of water howellia (lower precipitation and/or hotter summer temperatures). Available information indicates that increased variability in future climate conditions is likely, but that water howellia has some plasticity to environmental change as evidenced by the species' viability despite a changing climate and its life-history strategy of dual seed production and longer-term seed viability to buffer against several consecutive years of unfavorable environmental conditions. Therefore, based upon the best available information, we conclude that climate change is not a significant threat to water howellia.

#### Small Population Size and Low Genetic Diversity

The final rule to list water howellia (59 FR 35860; July 14, 1994) cited small population size (i.e., limited extent of occupied habitat) as a contributor to its vulnerability. Species that occupy limited amounts of habitat often have reduced viability because they may lack resiliency to recover from stochastic events. Water howellia currently occupies about 400 acres of habitat rangewide, comprised of 307 occurrences with most occurrences occupying less than 1 acre. While most of the occurrences of

water howellia are small in areal extent, the arrangement of occupied habitat across 5 States is advantageous to water howellia because increased redundancy and representation increase the capacity of water howellia to survive a catastrophic event. Stochastic events still may affect individual occurrences, but the widespread arrangement of the occurrences increases redundancy and representation. Further, long-term monitoring has shown that water howellia are more tolerant of natural stochasticity or manmade disturbance in buffer areas surrounding occupied ponds than previously thought (Pipp 2017, p. 6). In addition, the documentation of 200 additional occurrences of water howellia since 1994 has increased the redundancy and representation of habitats for water howellia rangewide. This increased redundancy and representation of habitats increases the viability of water howellia, relative to 1994, because of an increased buffer against stochastic and catastrophic events.

The final rule to list water howellia (59 FR 35860; July 14, 1994) cited lack of genetic variation within and among occurrences as a contributor to its vulnerability. Low genetic diversity could limit a species' or population's ability to respond to novel changes in its environment, necessitating redundancy of occurrences across larger areas to increase the probability of survival. At the time of listing in 1994, the only genetic investigation of the species showed very low genetic diversity within and among occurrences in Washington and Montana (Lesica et al. 1988, p. 278). More current genetic results indicate greater genetic diversity within and among occurrences than previously thought; however, diversity is still relatively low (Brunsfeld and Baldwin 1998, p. 2; Schierenbeck and Phipps 2010, p. 5). Another genetic investigation documented that all occurrences are distantly related and that gene flow is likely occurring between the States (Schierenbeck and Phipps 2010, p. 6). However, it is also possible that these results indicate that infrequent, long-distance dispersal events (likely

facilitated by waterfowl) do occur, but actual gene flow is not occurring or rarely occurring.

The effects of low genetic diversity of water howellia on adaptability to future climate conditions are unknown. Water howellia is a self-pollinating species; thus, genetic diversity is expected to be lower, in general, than that for cross-pollinating species (Hamrick and Godt 1996, entire). Water howellia populations have remained stable despite rapidly changing air temperatures since the late 1990s (Snover et al. 2013, p. ES-3); however, it is unknown whether future air temperature trajectories will remain similar to those observed from the late 1990s to present. Another consideration is the time scale on which genetic diversity operates. For example, there has been considerable debate about what effective population size is adequate to conserve genetic diversity and long-term adaptive potential (see Jamieson and Allendorf 2012 for review, p. 579). However, loss of genetic diversity is typically not an immediate threat even in isolated populations (Palstra and Ruzzante 2008, p. 3441), but rather is a symptom of deterministic processes acting on the population (Jamieson and Allendorf 2012, p. 580). In other words, loss of genetic diversity typically does not drive species to extinction (Jamieson and Allendorf 2012, entire); other processes, such as habitat degradation, have a more immediate and greater impact on species viability (Jamieson and Allendorf 2012). We acknowledge the documented low genetic diversity of water howellia; however, the best available information indicates that the potential effects from low genetic diversity on water howellia's viability would not occur within the foreseeable future. In addition, the redundancy of smaller occurrences across the species' range may help mitigate for reduced genetic plasticity within individual occurrences because unfavorable environmental conditions affecting one or several occurrences may not affect other occurrences in different parts of the range. The current spatial arrangement of multiple occurrences spread across 5 States is favorable to the species' long-term viability because

these occurrences are at different elevations and within varying climatic regimes rangewide (see discussion under “Narrow Ecological Requirements/Climate Change,” above). Thus, we do not consider small population size or low genetic diversity to be a significant threat to water howellia.

#### Cumulative Effects of All Stressors

Many of the stressors faced by water howellia are interrelated and could work in concert with each other, resulting in a cumulative adverse effect on the species. For example, stressors discussed under Factor A that individually do not rise to the level of a threat could together result in habitat loss. Similarly, small population size in combination with stressors discussed under Factor A could present a potential concern.

Climate change is occurring across the range of the species, coinciding with all other identified stressors. As described previously, variations in climatic conditions may favor or preclude invasive species, depending on site-specific habitat factors. Also described previously, climate change may alter hydrological cycles. However, despite changing climate conditions, water howellia has sustained populations across its range. Analysis of long-term datasets and observations indicate the species has maintained viability even with climate change interacting with other potential stressors (Gilbert 2017, pers. comm.; Rule 2017, pers. comm.; Pipp 2017, entire; Rule 2020, in progress). This indicates that water howellia has some capacity to survive and reproduce, despite potential cumulative effects of climate change and other stressors to date. Nevertheless, we recognize that there are uncertainties associated with future climate change predictions and potential cumulative effects. Ongoing management and monitoring of water howellia (via the post-delisting monitoring plan) is designed to detect potential future changes in the species’ distribution and abundance.

There may be locations of water howellia occurrences where invasive species are present, and cattle have access to occupied ponds. Grazing may limit the expansion of

invasive species in these instances. Otherwise, we are not aware of particular locations within water howellia occurrences where multiple stressors occur. Also, we do not anticipate stressors to increase on federally managed lands, which afford protection to the species in most of the occupied habitat. Furthermore, the documented new occurrences and greater distribution of the species since it was listed in 1994 provide additional resiliency, redundancy, and representation across the range of the species, which is expected to increase the viability of the species in the face of cumulative threats. Therefore, we conclude, based on the available information, that cumulative effects are not a significant threat to water howellia.

#### *Summary of Other Factors Affecting the Species*

Given the lack of threats within water howellia occurrences and increases in the species' known distribution since listing in 1994, we conclude that climate change, small population size and low genetic diversity, and cumulative effects are not significant threats to water howellia.

#### *Existing Regulatory Mechanisms*

We examined the stressors identified within the other factors as ameliorated or exacerbated by any existing regulatory mechanisms or conservation efforts for water howellia. Section 4(b)(1)(A) of the Act requires the Service to take into account those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect endangered or threatened species. We consider relevant Federal, State, and Tribal laws, regulations, and other such binding legal mechanisms that may ameliorate or exacerbate any of the threats we describe in the threats analysis or otherwise enhance the conservation of the species. We give the strongest weight to statutes and their implementing regulations and to management direction that stems from those laws and regulations; an example is State governmental actions enforced under a State statute or constitution or Federal action under the statute.

For currently listed species, we consider the adequacy of existing regulatory mechanisms to address threats to the species absent the protections of the Act. Therefore, we examine whether other regulatory mechanisms would remain in place if the species were delisted, and the extent to which those mechanisms will continue to help ensure that future threats will be reduced or eliminated.

In our previous discussion of threats, we evaluate the significance of threats as mitigated by any conservation efforts and existing regulatory mechanisms. Where threats exist, we analyze the extent to which conservation measures and existing regulatory mechanisms address the specific threats to the species. Regulatory mechanisms, if they exist, may reduce or eliminate the impacts from one or more identified threats.

Although inadequacy of existing regulatory mechanisms was not specifically identified as a threat to water howellia at the time of listing in 1994, we did mention the very limited number of protections that existed for the species (59 FR 35860, July 14, 1994, see p. 59 FR 35862). Specifically, we discussed the designation of water howellia as a sensitive species by the USFS and referred to wetland protection measures provided under section 404 of the Federal Clean Water Act (33 U.S.C. 1251 et seq.), title XII of the Food Security Act of 1985 (16 U.S.C. 3801 et seq.), and some State laws.

#### Federal

*Clean Water Act:* The Clean Water Act (CWA) was designed, in part, to protect surface waters of the United States from unregulated pollution from point sources. The CWA provides some benefit to water howellia through the regulation of discharge into surface waters through a permitting process; however, the historical threats to water howellia habitat have not typically been associated with point sources of pollution, and current information does not point to these as threats for occurrences today.

Under section 404 of the CWA, the U.S. Army Corps of Engineers (USACE) regulates the discharge of fill material into waters of the United States, including



wetlands. In general, the term “wetland” refers to areas meeting the USACE’s criteria of hydric soils, hydrology (either sufficient annual flooding or water on the soil surface), and hydrophytic vegetation (plants specifically adapted for growing in wetlands). Some habitat occupied by water howellia is considered isolated waters under the CWA. As a result of various Supreme Court decisions, the CWA’s jurisdiction over isolated waters has been uncertain and generally determined case-by-case. Further, Federal agencies are currently considering removing isolated waters from CWA jurisdiction (82 FR 34899; July 27, 2017). Thus, the extent of water howellia receiving the protections of the CWA now and in the future is uncertain. However, the protections of the CWA to water howellia habitat that is under CWA jurisdiction are expected to remain when the species is delisted and the protections of the Act removed.

*Food Security Act:* The Food Security Act was designed, in part, to protect wetlands by removing incentives for farmers to convert wetlands into crop fields. The Food Security Act likely provides some indirect protection of potential water howellia habitats on private land, but not those on Federal or State land. Although there are no data directly linking the Food Security Act and water howellia, historically, it has been demonstrated that the Food Security Act has had positive impacts on wetland function (Gleason et al. 2011, p. S65). Although the future of the Food Security Act in its current form is uncertain, any protections afforded to wetlands would confer benefit to water howellia should the species be present.

*National Environmental Policy Act:* Environmental review of potential effects of Federal actions is mandated under the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.). When NEPA analysis reveals significant environmental effects, the Federal agencies must disclose those effects to the public and consider mitigation that could offset the effects. These mitigations usually provide some protections for listed species. However, the NEPA does not require that adverse impacts be mitigated, only

disclosed. Therefore, because NEPA is procedural, it does not independently provide protection for the species.

*National Forest Management Act:* Federal activities on USFS lands are subject to the National Forest Management Act of 1976 (NFMA; 16 U.S.C. 1600 et seq.). The NFMA requires the development and implementation of resource management plans that guide the maintenance of ecological conditions that support natural distributions and abundance of species and not contribute to their extirpation.

In 2018, the Flathead National Forest in Montana revised its resource management plan (often called a forest plan), and the Mendocino National Forest in California anticipates revising their forest plan in the near future. The revised Flathead National Forest plan includes measures for conservation of the known water howellia occurrences on USFS land in Montana by incorporating the existing USFS conservation strategy for water howellia into the revised forest plan (USFS 2018, pp. 20, 45–46, 52, 99–100, 143–144; Shelly 2019, pers. comm.; USFS 1997, pp. 17–18). The inclusion of the conservation strategy into the revised forest plan is important, because in addition to providing conservation measures for known water howellia occurrences, it also provides for conservation of ponds that are suitable habitat but are currently unoccupied. Guidance provided in the Mendocino National Forest plan has resulted in the use of buffer strips to protect riparian species and function surrounding ponds occupied by water howellia in California. Both the Flathead National Forest plan and Mendocino National Forest plan are expected to continue to be implemented when water howellia is delisted, based on discussions with the USFS (see *Conservation Efforts* and *Habitat-based Threats*, above) and the fact that these plans are longer term (15+ years; NFMA, 16 U.S.C. 1600 et seq.) forest planning documents. Further, NFMA requires forest plans to provide protection for streams, stream banks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of

sediment, where tree harvests are likely to seriously and adversely affect water conditions or fish habitat. Thus, any future revisions to the Flathead National Forest or Mendocino National Forest plans would still provide some protections to water howellia and its habitat.

Water howellia is given consideration as a Federal species at risk by Federal agencies under the 2012 National Forest System land management planning rule (77 FR 21162; April 9, 2012). When delisted, water howellia will be evaluated for designation as a species of special concern and designated as such if there is substantial concern for its viability in the plan area. The USFS anticipates that water howellia will be given the status of “species of conservation concern” in both plans when the species is delisted (Shelly 2016, pers. comm.; Johnson 2017, pers. comm.). If water howellia is not given the status of “species of conservation concern” upon delisting, the 2012 planning rule still requires any forest plan to provide for the diversity of plant and animal communities and the long-term persistence of native species in the plan area. Further, the planning rule also requires a forest plan to provide ecological conditions to keep common native species common, contribute to the recovery of endangered and threatened species, conserve candidate species and species proposed for listing, and maintain viable populations of species of conservation concern within the plan area. Thus, any future revisions to the Flathead National Forest or Mendocino National Forest plans will provide some protections to water howellia and its habitat.

*Federal Land Policy and Management Act:* Similar to NFMA, the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.) applies to the Bureau of Land Management (BLM) with regard to the conservation and use of public lands under their management. Water howellia is given consideration as a federally listed species by Federal agencies, and when delisted, will likely be included on the sensitive species list for the BLM as it was at the time of listing (59 FR 35860; July 14, 1994). Special status

species policies (BLM manual, section 6840, p. 37) detail the need to conserve these species and the ecosystems on which they depend using all methods and procedures which are necessary to improve the condition of special status species and their habitats to a point where their special status recognition is no longer warranted. The one occurrence of water howellia in Washington on BLM land is vulnerable to localized actions. However, application of best management practices (BMPs) consistent with resource management plan (RMP) direction appears to have maintained this occurrence since 1993 (Frymire 2017, pers. comm.). The implementation of BMPs is expected to continue in the absence of protections under the Act.

*Sikes Act:* Water howellia occurrences and habitats on Federal military installations (JBLM in Pierce County, Washington) are managed under an integrated natural resources management plan (INRMP) (USDOD 2006, pp. 4–6) authorized by the Sikes Act (16 U.S.C. 670a et seq.). Protections for water howellia habitat in the INRMP include restrictions on motorized equipment and military training activities in wetlands occupied by water howellia. In concert with the INRMP, JBLM has developed an Endangered Species Management Plan for water howellia that establishes conservation goals, management prescriptions, and monitoring efforts (USDOD 2012, entire). These protections are expected to continue when the species is delisted because the Sikes Act mandates USDOD to conserve and rehabilitate wildlife, fish, and game on military reservations.

*National Wildlife Refuge System Improvement Act:* As directed by the National Wildlife Refuge System Improvement Act (Pub. L. 105–57, 16 U.S.C. 668dd), Refuge managers have the authority and responsibility to protect native ecosystems, fulfill the purposes for which an individual refuge was founded, and implement strategies to achieve the goals and objectives stated in management plans. For example, Turnbull NWR (Spokane County, Washington) includes extensive habitat for water howellia,

including 35 known occupied sites. The NWR's comprehensive conservation plan (CCP) is a land management plan with a 15-year term that directs protection of these habitats and identifies specific objectives relative to research and monitoring, invasive species management, and education regarding water howellia (USFWS 2007, p. 2-22). Given the 15-year timeframe of CCPs, unless the CCPs are modified earlier, these protections will remain in place until at least 2022 regardless of water howellia's Federal listing status. After 2022, the Turnbull NWR can revise the CCP, if needed. However, the likelihood of future CCP revisions including conservation of water howellia are high, because the National Wildlife Refuge System Improvement Act mandates conservation of fish, wildlife, and plants, and their habitats within the Refuge System. In addition, the overarching goal of the National Wildlife Refuge System is to manage their lands and waters for the conservation of fish, wildlife, and plant resources and their habitats, further underscoring the high likelihood of future protections for water howellia and its habitat.

In 2010, Ridgefield NWR in western Washington finalized a CCP that includes several conservation strategies for water howellia. These strategies include allowing natural flooding cycles and various methods (e.g., mechanical, biological, chemical) for invasive species control (USFWS 2010, pp. 2-37, 2-54). Given the 15-year timeframe of CCPs, protections outlined in the Ridgefield NWR CCP for water howellia are expected to remain in place until at least 2025, regardless of water howellia's Federal listing status. After 2025, the Ridgefield NWR can revise the CCP, if needed. However, the likelihood of future CCP revisions including conservation of water howellia are high, because the National Wildlife Refuge System Improvement Act mandates conservation of fish, wildlife, and plants, and their habitats within the Refuge System. In addition, the overarching goal of the National Wildlife Refuge System is to manage their lands and waters for the conservation of fish, wildlife, and plant resources and their habitats, further underscoring the high likelihood of future protections for water howellia and its habitat.

State

*Montana Streamside Management Zone Act:* The Montana Streamside Management Zone Act (SMZ), in part, designates vegetated buffer strips around surface waters, including wetlands adjacent to streams (and thus potential water howellia habitat), within the boundaries of timber harvest units in Montana. The SMZ law covers Federal, State, and private commercial timber practices (Montana Code Annotated 2019, title 77, chapter 5, part 3). The SMZ law specifically prohibits slash fill of wetlands, off-road vehicle use, and clear cutting within 50 ft (15 m) of water bodies (Montana Code Annotated 2019, title 77, chapter 5, part 3, at 77-5-303). There are no buffer strips designated for isolated wetlands (those not adjacent to a stream/river) under the SMZ and only voluntary restrictions on equipment travel through isolated wetlands. Although unclear, some water howellia occurrences in Montana's Swan Valley may occur in isolated wetlands. Thus, the direct loss of habitat or plants for a small number of occurrences from timber harvest activities is a possibility if water howellia plants occupy isolated wetlands within a timber harvest unit. However, audits of timber sale practices conducted by interdisciplinary review teams have consistently documented few violations of the SMZ law and generally high (greater than 90 percent) compliance with voluntary regulations in the recent past (Montana DNRC 2016, entire). Thus, while there is potential for water howellia habitat to be lost for occurrences in isolated wetlands, the magnitude of the stressor appears small. As State law, the protections of the SMZ are expected to continue when we delist water howellia.

*Washington Natural Heritage Plan:* Washington State's Natural Heritage Plan identifies priorities for preserving natural diversity, including wetlands, in Washington State (Washington Department of Natural Resources (DNR) 2007, 2011, entire). The plan aids Washington DNR in conserving key habitats that are currently imperiled or expected

to be in the future. The prioritization of conservation efforts provided by this plan is expected to remain in place when we delist water howellia.

*Washington Forest Practices Act:* Washington State's Forest Practices Act, and associated regulations and rules (Revised Code of Washington, title 76, chapter 76.09; Washington Administrative Code, title 222, chapter 222–08), provides protection of wetlands from the fill and cutting that could result from commercial timber harvest operations. Minimum buffers of 25 ft (8 m) are designated around ponds and wetlands inside timber sale boundaries, effectively prohibiting most harvest and all heavy equipment used in these areas. These buffers protect water howellia habitat from disturbance and minimize impacts to water quality. As State law, these protections are expected to remain in place when we delist water howellia.

*Oregon Revised Statutes (ORS), Chapter 564:* ORS 564 requires non-Federal public agencies to protect State-listed plant species found on their lands. Any land action on Oregon non-Federal public lands which results, or might result, in the taking of an endangered or threatened species requires consultation with the Oregon Department of Agriculture (ODA) staff. Removal of Federal protections for water howellia will remove State protection of the species under this statute because water howellia was never formally listed by ODA. However, protections are expected to remain in place due to other rare, sensitive plant species in the area inhabited by water howellia and the commitment of the Metro (Portland-area regional government) to protect the only known occurrences of water howellia in Oregon (Currin 2013, pers. comm.).

#### *Summary of Existing Regulatory Mechanisms*

As discussed above and under the other factors, conservation measures and existing regulatory mechanisms (such as Federal and State land management plans and conservation strategies) have ameliorated, or are continuing to minimize, the previously identified threats of invasive species, land management activities (primarily timber

harvest and road building), trampling by domestic livestock, and direct habitat loss from urbanization or dam construction to all three water howellia metapopulations. As indicated above, the majority of these mechanisms will remain in place regardless of the species' Federal listing status. In Montana, the existing conservation strategy for water howellia is now part of the Flathead National Forest Plan; thus, the Montana metapopulation will continue to receive protections regardless of its status under the Act. In Washington on National Wildlife Refuges, there is a high likelihood that any future CCP revisions will include protections for water howellia because the mission of the National Wildlife Refuge System is to manage their lands specifically for conservation of fish, wildlife, and plant resources and their habitats; thus, water howellia and its habitat on Refuge land are expected to be conserved into the future. In Washington on JBLM, an Endangered Species Management Plan specifically speaks to the management of wetlands to benefit water howellia, and the Sikes Act mandates wetland protection, enhancement, and restoration, where necessary for the support of fish, wildlife, or plants, regardless of the species' status under the Act. Thus, all three metapopulations are protected by regulatory mechanisms that have been shown to be effective and are expected to continue to be effective regardless of the species' status under the Act. Consequently, we find that conservation measures, along with existing regulatory mechanisms, are adequate to address these specific stressors.

### **Summary of Comments and Recommendations**

In the proposed rule published in the *Federal Register* on October 7, 2019 (84 FR 53380), we requested that all interested parties submit written comments on our proposal to delist water howellia by December 6, 2019. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. Newspaper notices inviting general public comment were published in California (Times Standard in Eureka and Mendocino



Beacon in Fort Bragg), Montana (Missoulian in Missoula and Interlake in Kalispell), Oregon (Oregonian in Portland), and Washington (News Tribune in Tacoma and Spokesman Review in Spokane). We did not receive any requests for a public hearing. All substantive information provided during the comment period was either incorporated directly into this final rule or is addressed below.

#### *Peer Reviewer Comments*

In accordance with our joint policy on peer review policy published on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act (USFWS 2016, entire), we solicited expert opinion from nine knowledgeable individuals with scientific expertise and familiarity with water howellia, its habitat, its taxonomy, its biological needs and potential threats, or principles of conservation biology. We received responses from three peer reviewers.

We reviewed and addressed all comments we received from the peer reviewers for substantive issues and new information regarding the proposed delisting of water howellia. The peer reviewers provided additional information, clarifications, and suggestions to improve the final rule. All changes suggested by peer reviewers are incorporated into the text of this final rule. Such changes include additional details and/or clarity concerning population monitoring vs. surveying, predicted effects of invasive species, regulatory mechanisms, climate change, wetland/pond hydrology, genetic diversity, cumulative effects, post-delisting monitoring, and metapopulation structure. We also made other minor editorial clarifications and corrections in this final rule based on peer reviewer comments.

#### *Public Comments*

We received six letters from the public that provided comments on the proposed rule. Most of these commenters either generally supported or generally opposed the delisting of the species without providing further information.

One commenter opposed our use of 2013 data to support our proposed delisting action; this commenter argues that these data are outdated. We have incorporated updated sources of information (118 instances of using data more recent than 2013), where applicable, in this rule and have not relied solely on data from 2013 (32 instances of using data from 2013, where appropriate). In accordance with section 4(b)(1)(a) of the Act, we use the “best scientific and commercial information available,” regardless of its date, to inform our determinations under section 4(a)(1) of the Act.

Another commenter provided substantive comments, mainly related to the occurrences of water howellia in California. We incorporated the updated information provided by this public commenter into this final rule.

### **Determination of Water Howellia’s Status**

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of “endangered species” or “threatened species.” The Act defines an “endangered species” as a species that is “in danger of extinction throughout all or a significant portion of its range,” and a “threatened species” as a species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The Act requires that we determine whether a species meets the definition of “endangered species” or “threatened species” because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

### *Status Throughout All of Its Range*

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to water howellia, including invasive species (Factor A), land management activities (Factor A), trampling by domestic livestock (Factor A), direct habitat loss from urbanization or dam construction (Factor A), predation (herbivory) by domestic livestock (Factor C), narrow ecological requirements of the species in the context of climate change (Factor E), small population size/low genetic variation (Factor E), and cumulative effects of stressors (Factor E). Based on the best available information, and as described in our threats analysis, above, the identified stressors fall into one or more of the following categories:

- Stressors that have not occurred to the extent anticipated at the time of listing and existing information indicates that this will not change in the future (trampling by domestic livestock, predation (herbivory), direct habitat loss from urbanization or dam construction).
- Stressors that are adequately managed and existing information indicates that this will not change in the future (invasive species, land management activities).
- Stressors for which the species is tolerant and existing information indicates that this will not change in the future (narrow ecological requirements of the species in the context of climate change, small population size/low genetic variation, cumulative effects).

Thus, our analysis of this information indicates that these stressors are not of sufficient imminence, intensity, or magnitude to indicate that water howellia is in danger of extinction or likely to become so within the foreseeable future throughout all of its range. Therefore, after assessing the best available information, we determine that water howellia is not in danger of extinction throughout all of its range nor is it likely to become so in the foreseeable future throughout all of its range.

### *Status Throughout a Significant Portion of Its Range*

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. Having determined that water howellia is not in danger of extinction or likely to become so in the foreseeable future throughout all of its range, we now consider whether it may be in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range—that is, whether there is any portion of the species’ range for which it is true that both (1) the portion is significant; and (2) the species is in danger of extinction now or likely to become so in the foreseeable future in that portion. Depending on the case, it might be more efficient for us to address the “significance” question or the “status” question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species’ range.

In undertaking this analysis for water howellia, we choose to address the status question first—we consider information pertaining to the geographic distribution of both the species and the threats that the species faces to identify any portions of the range where the species may be endangered or threatened.

For water howellia, we considered whether the threats are geographically concentrated in any portion of the species’ range at a biologically meaningful scale. We examined the following threats:

- Invasive species—Invasive species, particularly reed canarygrass, are widely scattered throughout the species’ range, with no concentration in any particular area. Furthermore, water howellia metapopulations appear to be able to coexist with invasive species even in the absence of suppression efforts.

- Land management activities—On Federal lands (where 84 percent of water howellia occurrences are), most land management activities that could disturb vegetation surrounding water howellia are now either prohibited or designed to minimize impacts. On State lands, clear-cutting of timber and broadcast burning are either prohibited within defined buffers or not identified as threats. Therefore, adverse practices on Federal and State lands are very infrequent and are not concentrated in any particular area of the species' range.

- Trampling by domestic livestock—Effects of trampling on water howellia occurrences on Federal and State land have largely been mitigated with fencing, cattle barricades, elimination of grazing in some areas occupied by water howellia, or limitations on the duration of time livestock have access to sensitive pond and wetland habitats. Therefore, effects from trampling on Federal and State lands are very infrequent and are not concentrated in any particular area of the species' range.

- Direct habitat loss from urbanization or dam construction—Further habitat loss from urbanization and dam construction is no longer a threat to the species because conservation strategies and increased Federal ownership now provide additional protections. Consequently, direct habitat loss from these activities is minimal and is not concentrated in any particular area of the species' range.

- Predation (herbivory) by domestic livestock—Similar to trampling, the effects from grazing are limited within water howellia habitat, and the species has maintained viability in ponds accessible to livestock. Therefore, its effects on Federal and State lands are not concentrated in any particular area of the species' range.

- Narrow ecological requirements of the species in the context of climate change—Metapopulations important to the viability of the species are expected to sustain occurrences because of resiliency due to geographic and elevational diversity rangewide. Some of the future predicted air temperature and precipitation conditions are similar to

the yearly weather conditions that promote larger abundances of water howellia (lower precipitation and/or hotter summer temperatures). Available information indicates that increased variability in future climate conditions is likely, but water howellia has some plasticity to environmental change as evidenced by its viability despite a changing climate and its life-history strategy of dual seed production and longer-term seed viability to buffer against several consecutive years of unfavorable environmental conditions. Therefore, despite occurring throughout the species' range, the potential effects are minimal and are not concentrated in any particular area of the species' range.

- Small population size/low genetic variation—Most occurrences of water howellia are small in areal extent; however, the arrangement of occupied habitat across five States increases redundancy, representation, and the capacity to survive a catastrophic event. In addition, the documentation of 200 additional occurrences of water howellia since 1994 has increased the redundancy and representation of habitats for water howellia rangewide. Small populations are not concentrated in any particular area of the species' range.

- Cumulative effects—Analysis of long-term datasets indicates the species has maintained viability and has the capacity to survive and reproduce, despite potential cumulative effects of climate change and other stressors. Potential cumulative effects are not concentrated in any particular area of the species' range.

We found no concentration of threats in any portion of the water howellia's range at a biologically meaningful scale. Therefore, no portion of the species' range can provide a basis for determining that the species is in danger of extinction now or likely to become so in the foreseeable future in a significant portion of its range, and we find that the species is not in danger of extinction now or likely to become so in the foreseeable future throughout all of its range. This is consistent with the court's holding in *Desert Survivors v. Department of the Interior*, No. 16-cv-01165-JCS, 2018 WL 4053447 (N.D.

Cal. Aug. 24, 2018) and *Center for Biological Diversity v. Jewell*, 248 F. Supp. 3d, 946, 959 (D. Ariz. 2017).

### *Determination of Status*

Our review of the best available scientific and commercial information indicates that water howellia does not meet the definition of an endangered species or a threatened species in accordance with sections 3(6) and 3(20) of the Act. Therefore, we are removing water howellia from the List of Endangered and Threatened Plants.

### **Effects of this Rule**

This rule revises 50 CFR 17.12(h) to remove water howellia from the Federal List of Endangered and Threatened Plants. Because no critical habitat was ever designated for this species, this rule does not affect 50 CFR 17.96.

The prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, will no longer apply to this species. Federal agencies will no longer be required to consult with the Service under section 7 of the Act in the event that activities they authorize, fund, or carry out may affect water howellia.

### **Post-delisting Monitoring**

Section 4(g)(1) of the Act requires us, in cooperation with the States, to implement a monitoring program for not less than 5 years for all species that have been delisted due to recovery. The purpose of this requirement is to develop a program that detects the failure of any delisted species to sustain itself without the protective measures provided by the Act. If at any time during the monitoring period, data indicate that protective status under the Act should be reinstated, we can initiate listing procedures, including, if appropriate, emergency listing.

We are delisting water howellia based on new information we have received as well as conservation actions taken. Since delisting is, in part, due to conservation taken by stakeholders, we have prepared a post-delisting monitoring (PDM) plan for water

howellia. The PDM plan was drafted collaboratively with stakeholders and was reviewed by both peer and public reviewers during the comment period for the proposed delisting rule (84 FR 53380; October 7, 2019). The PDM plan discusses the current status of the taxon and describes the methods for monitoring the taxon. The PDM plan: (1) Summarizes the status of water howellia at the time of delisting; (2) describes frequency and duration of monitoring; (3) discusses monitoring methods and sampling regimes; (4) defines what potential triggers will be evaluated to address the need for additional monitoring; (5) outlines reporting requirements and procedures; (6) outlines a schedule for implementing the PDM plan; and (7) defines responsibilities. It is our intent to work with our partners towards maintaining the recovered status of water howellia. The PDM plan is available on the Internet at <http://www.regulations.gov> at Docket No. FWS–R6–ES–2018–0045.

## **Required Determinations**

### *National Environmental Policy Act*

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), need not be prepared in connection with regulations pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the *Federal Register* on October 25, 1983 (48 FR 49244).

### *Government-to-Government Relationship With Tribes*

In accordance with the President’s memorandum of April 29, 1994, Government-to-Government Relations with Native American Tribal Governments (59 FR 22951), E.O. 13175, and the Department of the Interior’s manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities,



and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We are aware of two water howellia occurrences that occur on Tribal lands; we have notified the Tribes that may be affected by this rule and offered government-to-government consultation.

### **References Cited**

A complete list of all references cited in this rule is available on the Internet at <http://www.regulations.gov> at Docket No. FWS–R6–ES–2018–0045, or upon request from the Montana Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

### **Authors**

The authors of this final rule are staff members of the Montana Ecological Services Field Office and field and regional offices in California, Colorado, Idaho, Oregon, and Washington.

### **List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

### **Regulation Promulgation**

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

### **PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS**

1. The authority citation for part 17 continues to read as follows:

AUTHORITY: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

### **§ 17.12 [Amended]**

2. Amend § 17.12(h) by removing the entry for “*Howellia aquatilis*” under  
FLOWERING PLANTS from the List of Endangered and Threatened Plants.

---

**Martha Williams**

*Principal Deputy Director,*

*Exercising the Delegated Authority of the Director,*

*U.S. Fish and Wildlife Service.*

[FR Doc. 2021-12522 Filed: 6/15/2021 8:45 am; Publication Date: 6/16/2021]